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VOL. 23 NO. 11 March 16, 1973

Cooperative Economic Insect Report

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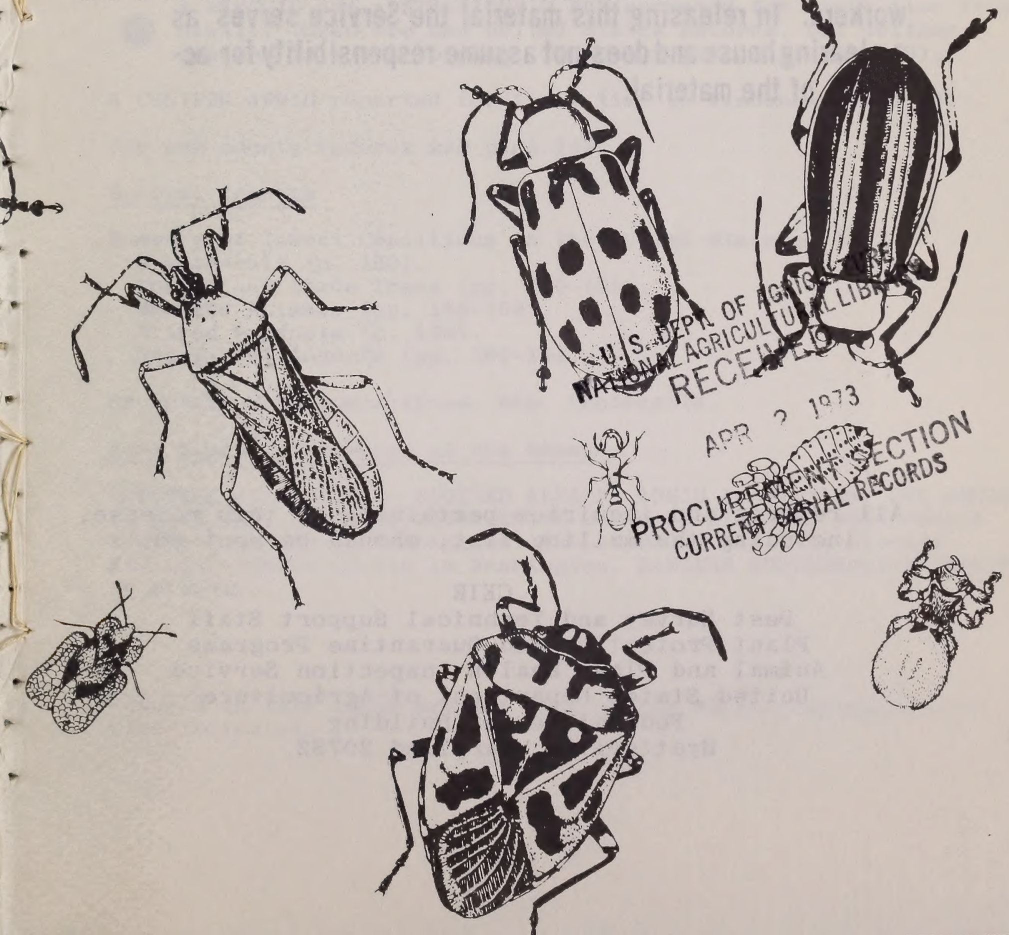
PLANT PROTECTION AND QUARANTINE PROGRAMS
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U.S. DEPARTMENT OF AGRICULTURE



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PLANT PROTECTION AND QUARANTINE PROGRAMS
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The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Service serves as a clearing house and does not assume responsibility for accuracy of the material.

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Plant Protection and Quarantine Programs
Animal and Plant Health Inspection Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782

Volume 23 March 16, 1973 Number 11

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG heavy on wheat in some areas of Texas Panhandle. (p. 145).

ALFALFA WEEVIL increasing in Texas, reported in southwest Missouri; adults light in Oklahoma. Hatching and light feeding in Illinois. EGYPTIAN ALFALFA WEEVIL larvae increasing in Sacramento and San Joaquin Valleys of California; this pest and alfalfa weevil may be severe. (pp. 145-146).

DIAMONDBACK MOTH increasing on late cabbage in southern Florida. (p. 146).

SOUTHERN PINE BEETLE outbreak may be most severe yet known in Alabama, continues to expand on Nantahala National Forest, North Carolina. (p. 147).

Detection

● A BRUCHID and a STRATIOMYID FLY reported for first time from Hawaii. These are new United States records, but neither species is known to occur in continental U.S. (p. 149).

A CONIFER APHID reported for first time in Wisconsin. (p. 147).

For new county records see page 148.

Special Reports

Summary of Insect Conditions in the United States - 1972
  Ornamentals (p. 150).
  Forest and Shade Trees (pp. 150-155).
  Man and Animals (pp. 155-159).
  Stored Products (p. 160).
  Beneficial Insects (pp. 160-161).

Browntail Moth Quarantines. Map. Centerfold.

Some First Occurrences of the Season

GREENBUG in Arkansas. SPOTTED ALFALFA APHID in Florida. PEA APHID in Arkansas. IMPORTED CABBAGEWORM moths in Alabama. PEAR PSYLLA adults and eggs in Washington. FALL WEBWORM adult in Florida. ELM LEAF BEETLE adults in Washington. EASTERN SUBTERRANEAN TERMITE in Missouri.

Reports in this issue are for week ending March 9 unless otherwise indicated.

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WEATHER OF THE WEEK ENDING MARCH 12

Reprinted from Weekly Weather and Crop Bulletin supplied by Environmental Data Service, NOAA.

PRECIPITATION: A number of weather systems produced a variety of weather over the Nation early in the week. One system, off the Oregon coast, caused rain along the Pacific coast from Washington to southern California. An elongated Low lay over the Rocky Mountains. It had a north-south orientation, centered over the central Rocky Mountains Monday. It separated, the northern portion centered over western South Dakota, and moved toward the Great Lakes. It caused snow from North Dakota to Minnesota, freezing rain over Upper Michigan, drizzle and fog elsewhere near the Great Lakes. The southern portion of the storm, centered over the Texas Panhandle, caused rain, drizzle, and fog from the southern Great Plains to the Atlantic coast. Heavy rain, some thunderstorms, hail, and a few tornadoes occurred over the southeastern quarter of the Nation. Tornadoes touched down in the vicinities of Belzoni and Fulton, both in Mississippi, and Tuscumbia, Alabama. A dying storm off the coast of Florida caused rain,drizzle, and fog along the middle and southern Atlantic coast. At midweek, a storm was centered over Lake Superior. A cold front extended from the storm center to the southern Great Plains. Prefrontal showers and thunderstorms occurred in the moist air ahead of the system. Flash floods caused considerable damage in central Alabama. Rain and drizzle fell along the Atlantic coast. By Wednesday afternoon, precipitation was widespread over the eastern and western portions of the Nation. Snow fell in the southern Rockies. Several inches fell along the Mogollon Rim and in the White Mountains of Arizona. Cloudiness and storminess increased late in the week over much of the Nation. Strong winds in the Far Southwest picked up dust and sand causing duststorms and sandstorms. Weather of the week continued on page 162.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

BEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Decrease in adult counts north of Big Panoche Canyon in western Fresno County indicates continued winter die-off. Flatland vegetation adjacent to overwintering slopes continues to make good growth. Only selected slopes expected to require treatment north of Big Panoche Canyon. Most slopes south of canyon appear favorable for beet leafhopper reproduction. Only selected slopes expected to require treatments in Coalinga area next few weeks. Surveys throughout most of Kern County overwintering areas indicate light adult populations. Some nymphs found on portion of Pentland Flats and south side of Elk Hills range. Vegetation growing throughout most of overwintering areas in county remains green except on steep areas of extreme southern exposures. (Cal. Coop. Rpt.).

GREENBUG (Schizaphis graminum) - TEXAS - Survey of 21 Panhandle counties, period February 16-27, showed maximum counts per row foot of wheat as follows: Motley 2,000, Hale 1,000, Hall 400, Castro 250, Deaf Smith 200. Remaining counties averaged 24 per row foot. (Boring). ARKANSAS - Collected on wheat in Washington County March 8 for first report this year. (Boyer).

POTATO PSYLLID (Paratrioza cockerelli) - ARIZONA - Heavy numbers of first to third-instar nymphs reported on lycium at Salt River Valley, Maricopa County. (Ariz. Coop. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - FLORIDA - About 300 nymphs and adults collected in 100 sweeps of alfalfa at Gainesville, Alachua County. (Mead).

SMALL GRAINS

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Ranged 4-5 per linear foot in wheat in Kiowa and Washita Counties. (Okla. Coop. Sur.).

ENGLISH GRAIN APHID (Macrosiphum avenae) - FLORIDA - About 125 nymphs and adults collected in 100 sweeps of 9-inch high oats at Gainesville, Alachua County. (Mead).

FORAGE LEGUMES

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Counts per 100 sweeps of alfalfa in Yuma County as follows: Yuma Valley 400-1,800, Yuma Mesa 10-600, Gila Valley 130-360, Dome Valley 60-1,200, Wellton 140-2,000. (Ariz. Coop. Sur.). OKLAHOMA - Ranged 3-5 per terminal in alfalfa checked in Kiowa and Washita Counties. (Okla. Coop. Sur.). ARKANSAS - Light, 100+ per 100 sweeps, in northern Logan County. Ranged 200-250 per 100 sweeps in alfalfa in Miller County; probably active in county about 14 days. First of season found in Washington County March 8. (Boyer, Jones).

ALFALFA WEEVIL (Hypera postica) - TEXAS - Activity increasing throughout State on alfalfa. Larval counts ranged to 151 and eggs 50 per square foot in Burleson County. Light to medium infestations (5 adults per 100 sweeps) in Wharton and Fort Bend Counties. (Boring et al.). OKLAHOMA - Eggs averaged 223 and 457 per square foot in Stephens and Payne Counties respectively. Adults light in alfalfa in Kiowa, Washita, Roger Mills, and Muskogee Counties. (Okla. Coop. Sur.). ARKANSAS - Three egg clusters found in north Logan County; no larvae nor adults present. Two adults but no larvae or eggs found in Miller County. (Boyer, Jones). MISSOURI - Adult activity reported in southwest area. Counts ranged 0-8 per 10 sweeps. Hatch observed in Newton and Barton Counties. (Munson). ILLINOIS - Hatching and light feeding noted in Gallatin and Hardin Counties. (Ill. Ins. Rpt.). TENNESSEE - Egg counts in Knox County ranged 25-30 per square foot. Some hatching and light feeding noted. (Bennett). VIRGINIA - Larvae should appear within next 14 days in southern Piedmont and Coastal Plain areas. Normally appear during third week in March. (Allen).

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - CALIFORNIA - Alfalfa beginning spring growth although weather cold and very wet past month. H. brunneipennis larvae increasing and treatments being applied in Sacramento and San Joaquin Valleys. Larvae ranged up to 20 per sweep in some fields. Weather predictions indicate H. brunneipennis and H. postica (alfalfa weevil) infestations may be severe and damage may extend over longer period than normal. (Cal. Coop. Rpt.). ARIZONA - Alfalfa field at Yuma Valley, Yuma County, with 6,000 larvae per 100 sweeps. Averaged 3 larvae per sweep in many fields in Salt River Valley, Maricopa County. (Ariz. Coop. Sur.).

POTATOES, TOMATOES, PEPPERS

GREEN PEACH APHID (Myzus persicae) - FLORIDA - Averaged 105 per 5-leaf sample on bell peppers with some signs of virosis appearing in plantings at Belle Glade, Palm Beach County, late February and early March. (Fla. Coop. Sur.).

COLE CROPS

DIAMONDBACK MOTH (Plutella xylostella) - FLORIDA - Populations increasing on late plantings of cabbage at Belle Glade, Palm Beach County. Expected to be heavy in area. (Fla. Coop. Sur.).

IMPORTED CABBAGEWORM (Pieris rapae) - ALABAMA - First adults of season observed in flight in central area; laying eggs on cole crops. (McQueen).

DECIDUOUS FRUITS AND NUTS

PEAR PSYLLA (Psylla pyricola) - WASHINGTON - Adults averaged 13 per tray and eggs 9 per 25 spurs at Wapato, Yakima County, February 27; adults 39 per tray and eggs 2 per 30 spurs at Summitview and Fruitvale, Yakima County, February 28. First eggs deposited at Rock Island, Douglas County, March 2; first sprays applied March 5 at this location and at sites in Chelan and Douglas Counties. (Gregorich, Rushmore).

HICKORY SHUCKWORM (Laspeyresia caryana) - ALABAMA - Larval survival heavy in old shucks under all pecan trees examined in Lee County. Pupation expected next 10-30 days. Larvae present in 10-20 percent of old shucks under many trees. (McQueen).

SMALL FRUITS

RAISIN MOTH (Cadra figulilella) - CALIFORNIA - Full-grown larvae found under bark of grapevines in Bakersfield, Kern County. Larvae developing in mummified bunches of grapes left on vines. (Cal. Coop. Rpt.).

ORNAMENTALS

NATIVE HOLLY LEAFMINER (*Phytomyza ilicicola*) - TENNESSEE - Larvae observed tunneling in holly leaves in eastern and middle areas. Larvae apparently overwintered in leaves, unusual for the State. (Hadden, Gordon).

FOREST AND SHADE TREES

SOUTHERN PINE BEETLE (*Dendroctonus frontalis*) - ALABAMA - Development continued in previously reported pine areas of Lee County. Additional trees dying along outer edges. Several hundred larvae, pupae, and adults per square foot of bark surface. Adult population explosion expected in these areas and other infested areas in 40+ counties in late March and April. Outbreak may be most severe yet known in State. (McQueen). NORTH CAROLINA - Outbreak continues to expand on Tusquittee Ranger District, Nantahala National Forest, Cherokee and Clay Counties. January survey indicates 3-fold increase in estimated number of infested trees per 1,000 acres of host type since July 1972. (Hunt). Also problem in pine-type forest in 40 counties. Outbreak increased rapidly in western half of State during late fall 1972. More than 3.6 million board feet of infested pine salvaged since July 1, 1972. (USFS).

A CONIFER APHID (*Cinara canadensis*) - WISCONSIN - Collected by C.J. Wertschnig from needles of *Juniperus* sp. on July 21, 1972, at Watertown, Jefferson County. Determined by L.M. Russell. This is a new State record. (Wis. Ins. Sur.).

FALL WEBWORM (*Hyphantria cunea*) - FLORIDA - First adult of season taken in blacklight trap in Gainesville area, Alachua County. (Fla. Coop. Sur.).

ELM LEAF BEETLE (*Pyrrhalta luteola*) - WASHINGTON - First adult emergence noted March 4 in Wenatchee, Chelan County. (Rushmore).

AN ARMORED SCALE (*Hemiberlesia quercicola*) - ARIZONA - Collected February 5, 1973, at Sedona, Coconino County on oak by J. May. Determined by R.J. Gill. This is a new county record. (Ariz. Coop. Sur.).

MAN AND ANIMALS

SCREWWORM (*Cochliomyia hominivorax*) - During period February 25 through March 3, there was one confirmed case reported in the continental U.S. from Starr County, Texas. Total of 112 confirmed cases reported from Mexico; about twice number reported previous period. Number of sterile flies released in U.S. this period totaled 73,620,000, all in Texas. Total of 166,191,500 sterile flies released in Mexico. (Anim. Health).

CATTLE GRUBS (*Hypoderma* spp.) - KENTUCKY - Larvae averaged 3 per head on untreated Holstein dairy cows of various ages in Fayette County. (Barnett). OKLAHOMA - *H. lineatum* (common cattle grub) ranged up to 10 per head (average 3) on steers checks in Payne County. Light numbers present in Cimarron County. (Okla. Coop. Sur.).

HORN FLY (Haematobia irritans) - FLORIDA - Adults averaged 24 per beef cow in herd near Lacrosse, Alachua County. (Fla. Coop. Sur.).

CATTLE LICE - TEXAS - Heavy infestations of Haematopinus eurysternus (shortnosed cattle louse) and Linognathus vituli (longnosed cattle louse) observed on beef cattle in Young and Wilbarger Counties. (Boring).

HOUSEHOLDS AND STRUCTURES

EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes) - MARYLAND - Swarm reports averaged 3 per week in Prince Georges, Montgomery, and Anne Arundel Counties. Peak activity expected in 21 days. (U. Md., Ent. Dept.). MISSOURI - First swarms of season reported from Butler and Scott Counties. (Munson).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

EUROPEAN CRANE FLY (Tipula paludosa) - WASHINGTON - Larvae averaged 38 per square foot in pasture examined February 7 in Whatcom County. This is same general area where early instar larvae averaged 1,800 per square foot in fall 1972. (Campbell). See CEIR 22(44):741.

RED IMPORTED FIRE ANT (Solenopsis invicta) - TEXAS - Heavy mound building noted throughout south-central area. Heaviest activity noted in Waller, Grimes, and Harris Counties. Light activity only noted in Fort Bend County, site of recent control operations. (Green et al.).

DETECTION

New United States Records - A BURCHID (Callosobruchus albocallosus) - HAWAII - Maui. A STRATIOMYID FLY (Wallacea albiseta) - HAWAII - Oahu. (p. 149).

New State Record - A CONIFER APHID (Cinara canadensis) - WISCONSIN - Jefferson County. (p. 147).

New County Record - AN ARMORED SCALE (Hemiberlesia quercicola) ARIZONA - Coconino (p. 147).

CORRECTIONS

CEIR 23(8):93 - CORN, SORGHUM, SUGARCANE - "EUROPEAN CORN BORER (Ostrinia nubilalis) infestations were significant in occasional cornfields ..." should read "EUROPEAN CORN BORER (Ostrinia nubilalis) infestations were significant in occasional sorghum fields ..." (PPQ).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 3/5-8, BL - BLACK CUTWORM (Agrotis ipsilon) 1, GRANULATE CUTWORM (Feltia subterranea) 17, ARMYWORM (Pseudaletia unipuncta) 1.

HAWAII INSECT REPORT

New State Records - Specimens of a BRUCHID (Callosobruchus albocallosus Pic) in University of Hawaii and Hawaii Department of Agriculture collections, recognized as being new to State by J.W. Beardsley, were determined this species by J.M. Kingsolver. Earliest specimens collected in January 1965 by N.L.H. Krauss at Haiku, Maui. Subsequent specimens collected at light on Univeristy of Hawaii campus by J.W. Beardsley and on pigeon pea at Ewa by G. Funasaki, both on Oahu. (Funasaki).

Eight male specimens of a STRATIOMYID FLY (Wallacea albiseta de Meigere) collected at large December 3, 1972, at Waahila Ridge (400 meters elevation), Oahu, by F.G. Howarth. Two males taken at Mokuleia, Oahu, by W. Gagne dated September 1, 1970, subsequently noted in private collection. Determined by M.T. James. W. albiseta described from Java and later recorded from Taiwan, Singapore, Okinawa, and Guam. A subspecies W. a. borealis described from the Bonin and Mariana Islands by M.T. James in 1962. (Howarth). As far as is known W. albiseta is of no economic importance. (PPQ).

Callosobruchus albocallosus and Wallacea albiseta are new United States records but are not known to occur in the continental U.S. (PPQ).

General Vegetables - BEET ARMYWORM (Spodoptera exigua) larvae very heavy on green onions at Koko Head, Oahu, with 80-90 percent of leaves infested or damaged. Light to moderate in adjacent onion planting; less than 30 percent of leaves infested or damaged. Larval mines of LEAFMINER FLIES (Liriomyza spp.) light in both fields. All stages of GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) heavy in snap beans at Waimanalo; moderate, but sporadically heavy, in 2 nearby soybean plantings and trace in greenhouse cucumbers in same area. (Kawamura).

Beneficial Insects - BRACONID WASPS (Opius importatus and O. phaseoli) and a PTEROMALID WASP (Halticoptera patellana) parasitized 100 percent of Melanagromyza phaseoli (bean fly) infesting snap bean and yardlong bean petioles collected at Waikapu and Puunene, Maui, during February. O. importatus dominant. Opius spp. parasitized 80-100 percent of M. phaseoli infesting cowpea and snap bean petioles collected at various sites on Kauai during same period. (Miyahira, Sugawa).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1972

(Continued from page 140)

ORNAMENTALS

Highlights: BAGWORM was heavy and damaging to evergreens in several States.

BAGWORM (Thyridopteryx ephemeraeformis) was a serious pest of untreated or improperly treated junipers throughout the eastern half of KANSAS. Infestations were heavier than normal in ARKANSAS and caused heavy losses where controls were not applied. Bagworm was the most destructive pest of coniferous shrubs throughout ALABAMA. This psychid was the most common problem encountered in ornamental pest surveys in MARYLAND for the fourth consecutive year. Infestations were heavy again this year in all parts of the State. The first bagworm larvae of the season in DELAWARE were noted on arborvitae and other evergreens during early June. Infestations were generally heavy in many areas of the State.

BRONZE BIRCH BORER (Agrilus anxius) was the major pest of ornamental white birch in MARYLAND. This wood borer has destroyed several hundred birch trees in Montgomery, Baltimore, Anne Arundel, and Prince Georges Counties. Also in Maryland, a JAPANESE WEEVIL (Pseudocneorhinus bifasciatus) continued to spread throughout the State. Heavy damage continued to be spotty and was restricted mainly to plantings of azalea, privet, rhododendron, and small leaf hollies.

SPRUCE SPIDER MITE (Oligonychus ununguis) caused heavy damage and some mortality in hemlock and spruce plantings in several areas throughout MARYLAND. Damage was most severe during July and August. SPIDER MITES (Tetranychus spp.) were again the most common arthropod pests of shrubbery in NORTH CAROLINA. Infestations were light in some nurseries with 5-50 percent of plants infested. TWOSPOTTED SPIDER MITE (Tetranychus urticae) was very heavy on roses, shrubs, and annual plants in CALIFORNIA, requiring repeated control applications early in the season.

BALSAM TWIG APHID (Mindarus abietinus) caused stunting and heavy degrading of Christmas trees throughout VERMONT. Infestations appear to be on the increase in managed tree stands.

A THRIPS (Scirtothrips inermis) was collected from liquidamber trees at Long Beach in Los Angeles County, CALIFORNIA, in May. This was the first record of this thrips on the North American Continent. (See CEIR 22(30):483).

FOREST AND SHADE TREES

Highlights: SOUTHERN PINE BEETLE was found in WEST VIRGINIA for the first time since 1882, and was serious in pine type forests in several Southern States. The potential for continued outbreaks is great in some of these States. MOUNTAIN PINE BEETLE continued to cause heavy losses to lodgepole pine in Oregon and is now epidemic in the eastern foothills of the Rocky Mountains in COLORADO. DOUGLAS FIR BEETLE was the most destructive pest of western OREGON forests but is expected to decrease in 1973. ELM SPANWORM is is expected to be serious in RHODE ISLAND during 1973. FALL WEBWORM was the heaviest in several years in Ohio. Heavy defoliation by FOREST TENT CATERPILLAR in Minnesota did not materialize due to cold weather preceding egg hatch. ELM LEAF BEETLE was serious on elms throughout COLORADO and unusally so throughout KANSAS.

SOUTHERN PINE BEETLE (Dendroctonus frontalis) was reported in WEST VIRGINIA for the first time since 1882. This bark beetle had killed 175-200 pitch pine trees on the Kanawha State Forest. Southern pine beetle continued to be a problem in the central Piedmont and the far western counties of NORTH CAROLINA. A survey conducted during August and September on the 220,000-acre Uwharrie National Forest indicated a southward spread from the northern boundary of the forest. Surveys conducted during 1971 and 1972 on the Tusquitee District of the Nantahala National Forest revealed a westward expansion of the outbreak there.

One of the most severe outbreaks of southern pine beetle recorded in ALABAMA occurred during 1972. The first report of major consequence occurred in a residential section of Auburn in Lee County July 6 where an exploding population killed approximately 100 growing and mature pine trees. Epidemic populations were reported during July, with 30 of the 67 counties surveyed found to be infested. By September, 40 of the 67 counties were reported as epidemic. At this time predator populations were at low levels. The potential population of this beetle for 1973 in the 21.7 million acres of pine forest in Alabama is the greatest ever known. Surveys of 1.6 million acres of pine type in MISSISSIPPI by State personnel revealed southern pine beetle populations in outbreak proportions in 9 southwestern counties where brood counts averaged 172 per square foot of bark surface. The presence of this bark beetle also was verified for the first time in the 4 east-central counties of Mississippi bordering Alabama. Brood densities of 366 per square foot of bark surface in the Homochitto National Forest (contiguous with the 9 southwestern counties) indicated the potential for continued high populations there. In ARKANSAS, a total of 1,090 new southern pine beetle infestations were detected in Ashley, Drew, and Union Counties, by the State Forestry Commission during the period May 15 to December 31. Controls involving cutting, burning, spraying or salvaging were applied to 1,039 of these new infestations.

MOUNTAIN PINE BEETLE (Dendroctonus ponderosae) continued to cause heavy losses in lodgepole pine stands in the Wallowa and Whitman, Umatilla, Malheur, Deschutes, Fremont, and Winema National Forests of OREGON. Losses in the Cascade Mountains to western white pine continued to decrease. Statewide losses of pine were estimated at 58,722,040 board feet. Heavy infestations of mountain pine beetle were found on ponderosa pine in the eastern foothills of the Rocky Mountains in COLORADO. These populations increased 5 to 6-fold over 1971 and are now in an epidemic status.

DOUGLAS FIR BEETLE (Dendroctonus pseudotsugae) caused severe tree kill in the Hood River drainage area of the Mt. Hood National Forest in OREGON. This was again the most destructive species in western Oregon forests where it accounted for an estimated loss of 14 million board feet of Douglas-fir. Populations are expected to subside in 1973.

DOUGLAS FIR TUSSOCK MOTH (*Hemerocampa pseudotsugata*) infestations increased very sharply in area and density in northeastern OREGON. A total of 118,650 acres were either defoliated or killed. Damage ranged moderate to heavy on young white fir trees in localized areas of high recreational value in the Spring Mountains of Clark County, NEVADA.

Although the extent and intensity of defoliation by SPRUCE BUDWORM (*Choristoneura fumiferana*) decreased in MINNESOTA over that of 1971, there was still much tree mortality and severe defoliation on mixed stands of balsam fir and white spruce in St. Louis, Lake, and Cook Counties during 1972. Overall defoliation is estimated at more than one million acres in Minnesota. Spruce budworm defoliated more than 40,000 acres of hemlock throughout PENNSYLVANIA.

COOLEY SPRUCE GALL APHID (*Adelges cooleyi*) was heavy in many areas of COLORADO with many galls on blue spruce trees. In Larimer County, populations averaged 5 galls per 40 terminal twigs which is heavier than the past four or five years. BALSAM WOOLLY APHID (*Adelges piceae*) continued to cause mortality of Fraser fir at a steady rate in NORTH CAROLINA. This pest was damaging in every major spruce fir area (total of 60,000 acres) in the Southern Appalachians except Mount Rogers in VIRGINIA.

A CONIFER SAWFLY (*Neodiprion pratti pratti*) defoliated pines in eastern and south-central KENTUCKY attacking Virginia, shortleaf, and pitch pines. The first hatch of the year was observed in mid-February. Percentages of larval defoliation of Virginia and shortleaf pines by district were as follows: South-central 40-70; northeastern 10-30; Kentucky River 30-50; eastern 10-30; and southeastern 20-40. Larvae of an other CONIFER SAWFLY (*Neodiprion taedae linearis*) heavily defoliated loblolly and shortleaf pines in western KENTUCKY. Defoliation ranged 75-100 percent in Calloway, Marshall, and Graves Counties, while counties along the Mississippi River incurred 50-75 percent defoliation.

ORANGESTRIPED OAKWORM (*Anisota senatoria*) damage ranged moderate to heavy on oak and chestnut throughout much of WEST VIRGINIA. This saturniid was taken on white oak at Pipestem, Summers County, September 10, 1972, by J.D. Hacker. This is a new county record. GREENSTRIPED MAPLEWORM (*Anisota rubicunda*) completely defoliated many silver maples in Pottawatomie and Shawnee Counties, KANSAS, during late August. This pest was very heavy on honeylocusts in some cities in northeast and east-central counties. Defoliation of 50-100 percent in Riley and Shawnee Counties was common during late August.

LARGE ASPEN TORTRIX (*Choristoneura conflictana*) was unusually heavy on poplar stands over much of the northern two-thirds of MAINE. West of Moosehead Lake, defoliation was very noticeable from the ground and the air. This is the first instance of such heavy populations in many years and possibly since 1931 when some 100,000 acres of poplar were defoliated. Defoliation increased an estimated 2 million acres in MINNESOTA. Large portions of St. Louis, Cook, and Lake Counties were affected with smaller areas in Koochiching, Beltrami, Lake of the Woods, Itasca, and Carlton Counties being damaged.

THE FOLLOWING REGULATED ARTICL
CERTIFICATE OR PERMIT YEAR-ROU

Deciduous trees, and shrubs with p
parts of such trees and shrubs, wit

Trees and shrubs, and parts there
in a greenhouse throughout the
the outside of each container.*

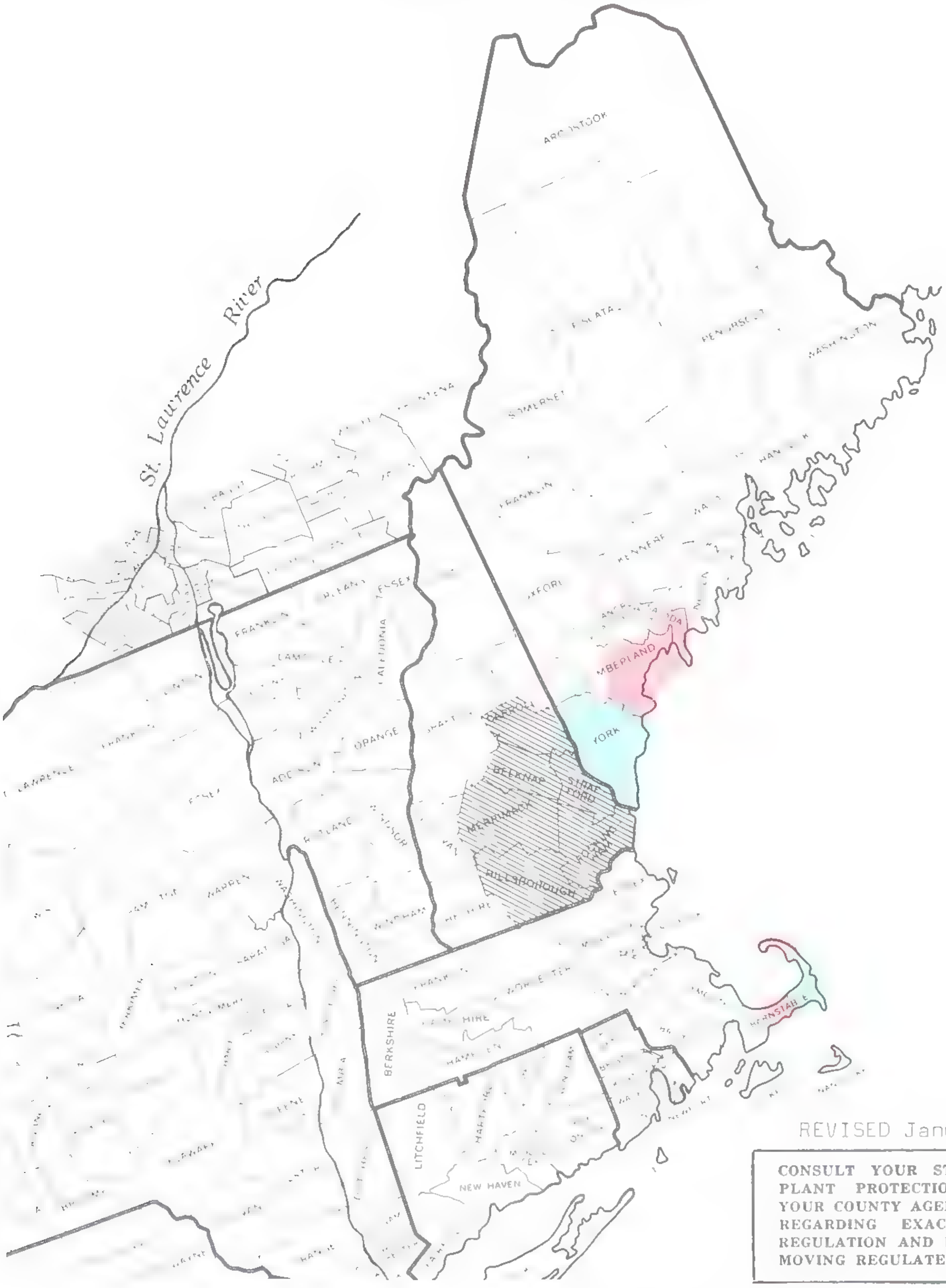
*-Exempt if not exposed t
the prescribed handling.

Or

The SA

BROWNTAIL MOTH QUARANTINES

U S DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE PROGRAMS
COOPERATING WITH AFFECTED STATES



REVISED January 19, 1973

CONSULT YOUR STATE OR FEDERAL PLANT PROTECTION INSPECTOR OR YOUR COUNTY AGENT FOR ASSISTANCE REGARDING EXACT AREAS UNDER REGULATION AND REQUIREMENTS FOR MOVING REGULATED ARTICLES.

COLORED ARE COMPLETELY REGULATED
COLORED ARE PARTIALLY REGULATED

NFESTED AREA-STATE AND FEDERAL REGULATIONS
REATMENTS NOT IN PROGRESS OR PLANNED)

AREA-STATE, AND FEDERAL REGULATIONS
REATMENTS IN PROGRESS OR PLANNED)

REGULATIONS REMOVED

RESTRICTIONS ARE IMPOSED ON MOVEMENT OF REGULATED ARTICLES FROM A REGULATED AREA AS FOLLOWS

1 FROM RED INTO OR THROUGH GREEN, OR WHITE
2 FROM GREEN INTO OR THROUGH WHITE
3 GREEN INTO GREEN
4 WITHIN GREEN *

*IF REQUIRED BY AN AUTHORIZED INSPECTOR

SEE REVERSE SIDE FOR LIST OF REGULATED ARTICLES

OAK LEAFTIER (*Croesia albicomana*) was the major pest of red oak from the mid-1950's to the mid-1960's in PENNSYLVANIA. Again in 1972 it was present in large numbers. Another siege of oak mortality most likely can be expected for the next few years in Pennsylvania. Larvae of a TORTRICID MOTH (*Archips semiferanus*) defoliated 159,620 acres of Sproul State Forest in Clinton and Centre Counties, PENNSYLVANIA. Statewide defoliation, which covered one million acres the previous two years, decreased to 610,000 acres in 1972. This is undoubtedly the worst forest pest disaster to occur in the State in many decades.

SPRING CANKERWORM (*Paleacrita vernata*) caused moderate to severe defoliation of shade trees, particularly elms, in many areas of NEBRASKA in May and June. Male moths were active in Cass County, NORTH DAKOTA, on March 20. Male and female moth emergence peaked in Fargo by April 14. Eggs were present in Hettinger County April 18 and in Ward and Renville Counties by May 5. Tanglefoot bands on trees in Walsh, Pembina, and Grand Forks Counties had 14 females per square inch by May 5. Adult emergence was complete over the State by May 26. First-instar larvae hatched in Bottineau County by May 19 and 40 percent had hatched by May 23 in Pembina County. Infestations and damage were heavy and widespread throughout the northern half of North Dakota by June 2. Larvae were fully grown by June 2 and maximum defoliation had occurred by June 9.

The extent and severity of defoliation by larvae of a GEOMETRID MOTH (*Hydria prunivorata*) increased substantially in PENNSYLVANIA during 1972. Defoliation was heaviest on the eastern portion of the Allegheny National Forest and in adjacent areas of State and private forest lands. Defoliation was heavy on 26,500 acres of forest in Elk County. In this area of the State, defoliation ranged light to moderate on 86,500 acres of black cherry which comprises 5-90 percent of the northern hardwoods. Defoliation was also heavy on 7,000 acres of McKean County and 6,000 acres in Tioga County.

Late-instar larvae of ELM SPANWORM (*Ennomos subsignarius*) were feeding in Washington County, RHODE ISLAND, by July 3. Adults were heavy in Providence, Kent, and Washington Counties during the period July 14-17. Elm spanworm is expected to cause much damage to forested areas of the State in 1973. BRUCE SPANWORM (*Operophtera bruceata*) and a LEAFROLLER MOTH (*Sparganothis acerivorana*) caused widespread and locally heavy defoliation of maple over the northern two-thirds of MAINE in late May and early June. This insect complex caused up to 75 percent defoliation of forest trees in several limited areas of Maine.

The SADDLED PROMINENT (*Heterocampa guttivitta*) outbreak of 1970-1971 in NEW HAMPSHIRE collapsed during 1972. Light trap collections of adults decreased by 95 percent from 1971 collections. Only a few acres of forest trees in isolated areas were considered heavily defoliated. VARIABLE OAKLEAF CATERPILLAR (*Heterocampa manteo*) caused widespread damage throughout WEST VIRGINIA with heaviest infestations in Hardy, Wayne, and Hampshire Counties. This notodontid moth was collected on hawthorn in Coopers Rock State Forest, Preston County, September 11, 1972, by L. Butler. This is a new county record. Larvae of another NOTODONTID MOTH (*Symmerista canicosta*) caused severe defoliation on 200 acres of bur oak in Dickinson, Lyon, and Sioux Counties, IOWA. The area of defoliation by this pest is increasing.

THE FOLLOWING REGULATED ARTICLES MUST BE MOVED UNDER CERTIFICATE OR PERMIT YEAR-ROUND EXCEPT AS INDICATED:

Deciduous trees, and shrubs with persistent woody stems, and parts of such trees and shrubs, with leaves attached.

Trees and shrubs, and parts thereof, are exempt if grown in a greenhouse throughout the year and so labeled on the outside of each container.*

*-Exempt if not exposed to infestation after the prescribed handling.

FALL WEBWORM (Hyphantria cunea) first-generation larvae appeared in early July on various shade trees in Chaves and Dona Ana Counties, NEW MEXICO. Second-generation larvae caused partial or complete defoliation of all types of shade and pecan trees. In October larvae began moving onto walls and entering homes. Heavy webbing of this pest in pecan and walnut trees occurred throughout the Piedmont and Coastal Plains of NORTH CAROLINA, first appearing in early June. Counts of webs in persimmon and pecan trees along U.S. Highway 64 from Tyrrell County to Rowan County June 14 and 15 ranged 0-10 per tree. The heaviest fall webworm population in several years was present in northeastern and east-central OHIO and in the Tar Hollow State Forest vicinity. First-instar larvae were seen feeding in Wayne, Jefferson, and Carroll Counties by the second week in June. Infestations of up to 40 tents per tree were noted in many northeastern and east-central counties. Fall webworm webs were first reported on cherry, apple, and wild cherry in Darlington, Beaver County, PENNSYLVANIA, July 15. Damage was evident along roads in many southwestern areas. About 70 percent defoliation occurred on 4,000 acres of black cherry and crab apple in Hanover Township, Washington County.

EASTERN TENT CATERPILLAR (Malacosoma americanum) egg hatch began about the second week of April in southern OHIO and 14 days later in northern areas. Noticeable feeding damage occurred on apple and sweet cherry in Clermont, Harrison, and Carroll Counties. Hawthorn and crab apple in Franklin County and east-central areas contained up to 20 tents per tree. Pupation began in central and southern Ohio about May 22. Egg mass surveys indicated that the parasite, predator, and disease impact was not sufficient to reduce the numbers of overwintering egg masses. In KENTUCKY, the first egg hatch of the year was observed April 1 in McCreary County. Larval emergence was heavy in some areas and larvae continued to defoliate wild cherry well into May. Infestations were heaviest in Muhlenberg and Fayette Counties where tents averaged 46 and 44 per mile, respectively.

Eastern tent caterpillar egg hatch began in Lawrence and Johnson Counties, INDIANA, about April 14. Four-inch webs were present by April 21 in the metropolitan area of Indianapolis, where the insect was unusually heavy, infesting such unusual hosts as lilacs and other ornamentals. Larvae were full grown by May 12 in the southern half of the State, and were pupating in Indianapolis by May 19. New egg masses were found in Vigo County by June 30. Marion County had the heaviest infestations in the State while Warren, Tippecanoe, La Porte and Elkhart Counties had isolated pockets of heavy infestations. Eastern tent caterpillar was very abundant in ILLINOIS in 1972 although economic damage was minimal. By the end of April, young wild cherry and crab apple trees were completely defoliated throughout the southern half of the State with as many as 20 tents in some trees.

Eastern tent caterpillar egg hatch began about April 27 in southern WISCONSIN and webbing was noted by May 5. Larvae were in the second instar May 19, third instar by May 26 and fourth instar by May 31. Migration from trees began about May 31. Pupation began June 7 and adults began emerging about June 28. Trees mainly affected by this pest were black cherry, chokecherry, mulberry, and untreated apples. Heavy eastern tent caterpillar infestations were common on wild plum throughout most of the eastern half of KANSAS and on wild cherry in the southeastern areas.

FOREST TENT CATERPILLAR (Malacosoma disstria) completely defoliated an estimated 1,200 acres of tupelo and blackgum timber along the Roanoke River near Woodville in Bertie County, NORTH CAROLINA. Forest tent caterpillar larvae caused 30-100 percent defoliation on 1,700 acres of timber in the western counties of Muklenberg, McLean, and Hopkins in KENTUCKY, where oaks were the primary hosts. Heavy defoliation by forest tent caterpillar was expected over a minimum of 200,000 acres of forest in Koochiching County, MINNESOTA, in 1972 but a severe cold period preceding egg hatch in early May caused a drastic population reduction and no defoliation was recorded.

ELM LEAF BEETLE (Pyrrhalta luteola) was a serious problem on elms in all areas of COLORADO, with heavy infestations being common. Organized spray programs were necessary in several municipalities. This pest appeared on elms in NEW MEXICO in April and was a continuous problem throughout the State all season. Defoliation was almost complete in many areas where elms are the dominant shade trees. Elm leaf beetle damage to Chinese elms in TEXAS was heaviest in Wilbarger, Winkler, Ward, Ector, Midland, and Martin Counties. In OKLAHOMA, activity began during mid-April and damage to elms was heavy by early June. Damage by second and third-generation larvae was heavy on Siberian elms in most areas of the State during July and August.

Elm leaf beetle first-generation larvae caused unusally severe defoliation of Siberian elms throughout most of KANSAS. The first eggs of the 1972 season were observed in mid-April and hatching had begun by May 19. By June 9, pupation of the first generation had begun with foliar damage ranging up to 50 percent. A large percentage of first-generation pupae checked in Riley County had been killed by an unidentified fungus. This may have been largely responsible for the comparatively light succeeding generations. This leaf beetle was a very troublesome pest of elms throughout NEBRASKA. Damage by this pest was very severe on elms in Woodburg County, IOWA, during the first 14 days of June when larvae ranged 0-6 (average 2) per leaf. Larvae of elm leaf beetle were collected from elm at Denison, Crawford County, June 14 by M.E. LaRue. Specimens were determined by S.O. Ryan. This is a new county record.

MAN AND ANIMALS

Highlights: SCREWWORM outbreak in Southwest worst in several years. FACE FLY was difficult to control on beef herds in central MARYLAND and appeared on increase in KENTUCKY. HORN FLY was generally annoying to beef and dairy cattle in several areas. MOSQUITO populations, especially floodwater species, increased in Maryland after tropical storm Agnes. These pests were also annoying to man and livestock in other areas.

During 1972, there were 95,642 confirmed cases of SCREWWORM (Cochliomyia hominivorax) reported in the continental United States as follows: Texas 90,980; Arizona 2,320; New Mexico 1,269; Oklahoma 1,024; California 27; Kansas 8; Arkansas 6; Florida 2; Louisiana 2; Georgia 1; Alabama 1; and one case each from Colorado and Iowa, both originating in Texas.

The extent of the 1972 disaster was chronicled each month as it developed. Thus, end-of-the-year totals are appropriate, both for historical reasons and to demonstrate the severity of the outbreak the industry has been through.

Only six times in nine years has a State had 1,000 or more cases. In 1972, Texas had 28 counties with more than this number of cases. Val Verde County had the largest number of cases--3,003. Other totals were Medina 2,733; Kinney 2,595; Uvalde 2,593; De Witt 2,138; and Atascosa 2,053.

New records were set in 178 counties in Texas. Only nine of the State's 254 counties failed to record at least one case. All in East Texas, they were: Hardin, Jefferson, Marion, Morris, Nacogdoches, Newton, Orange, Sabine, and San Augustine.

Going into the year 10 counties had never reported an outbreak. During 1972, Camp, Dallam, Hansford, Jasper, Ochiltree, and Sherman fell by the wayside, leaving only four with unsullied records: Marion, Newton, Sabine, and San Augustine.

In thirteen States, 350 counties had one or more screwworm outbreaks confirmed within their boundaries.

Not all States set new screwworm records in 1972. Texas did, of course, nearly doubling its previous record of 49,484 in 1962, a figure which had been surpassed by about August 24 of 1972.

Compared to Texas, Arizona's 2,320 cases do not appear very heavy, but set against previous marks the outbreak there was considerably worse than in the Lone Star State, more than tripling its previous mark of 728 established in 1963.

Oklahoma's 1,024 was substantially ahead of its earlier high, 444 set way back in 1962.

Five States set automatic records with the first cases they had reported since program inception in 1962--Kansas 8, Florida 2, Alabama 1, Colorado 1, and Iowa 1.

Despite ranking third this year with 1,269 cases, it wasn't the worst year New Mexico has had. That dubious distinction goes to 1963, when 1,447 cases were detected.

Other non-recordbreakers included California with 27 in 1972, compared to 135 in 1968, and Arkansas with 6 against 25 a year ago.

The year ended with an unbroken 291 consecutive days during which the Mission Laboratory had received at least one screwworm sample. Not since March 15 had a working day passed without one of the flesh-eating larvae being identified.

There were 4,572 non-screwworm samples in the U.S. during 1972. This total represents slightly over one-fifth of all laboratory confirmed cases of screwworms and non-screwworms combined.

In Northern Mexico, there were 30,301 laboratory confirmed cases of screwworms during 1972. This total is almost 3.5 times the number of cases reported from this area in 1971. This year was the worst for Northern Mexico in program history--prior to this year, the 19,452 screwworms reported in 1968 had been the greatest number of cases confirmed.

Both the U.S. Virgin Islands and the British Virgin Islands were declared free of screwworms in November 1972.

COMMON CATTLE GRUB (Hypoderma lineatum) was heavy in 77 percent of yearling calves examined in Cherry County, NEBRASKA. Grubs averaged 15 per animal on February 29. Adult activity was noted in Keith, Logan, Lincoln, and McPherson Counties by May 31. Larvae of this oestrid fly were heavy in most areas of OKLAHOMA from mid-February into late March. First fall larvae were found in mid-September and by mid-November packing plants in several areas were reporting heavy damage to carcasses. H. lineatum continued to be a problem in the upland areas of ARKANSAS. In one herd in Benton County, 268 grubs were counted on 31 head. Populations and damage remained about the same as the past 3 years, in ALABAMA. Infestations were light to medium only due to better and more widespread use of proper pesticides.

FACE FLY (Musca autumnalis) was difficult to control in beef herds in central MARYLAND. Populations were moderate to heavy throughout the season. Populations ranged 5-30 per head during May, 20-40 per head in July and 30-100 per head in August. Annoyance to cattle dropped below economic levels in September. Face fly populations on the Eastern Shore were extremely light (1-2 per head) as expected. Face fly was very annoying to cattle in the mountain and western Piedmont counties of NORTH CAROLINA. Populations reached 50 flies per head during August in some localities. Populations increased in KENTUCKY compared to those of the past 4 years. Adults averaged 15.3 per animal per county statewide.

Face fly ranged 35-40+ per face in Crawford, Geauga, Jackson, and Wayne Counties, OHIO, in July. Up to 50+ flies per face caused severe annoyance to cattle in Coshocton and Guernsey Counties late in August. The first face flies of the season in ILLINOIS were observed during mid-April on cattle in the central area, when counts averaged less than 1 per animal. By mid-July surveys indicated that populations had increased to 25 per animal. These levels held up, at least in the northern two-thirds of the State, until late September. Annoyance to cattle began in WISCONSIN in late May and became general by June 3. Counts were heavy at various times in Outagamie, Chippewa, and Richland Counties. Several cases of pinkeye, presumably spread by face fly, were reported in Trempealeau County late in June. Control measures were necessary.

Face fly populations on beef cattle averaged 5 per head in Story County, IOWA, by June 23 and 40-70 per head on untreated beef cattle in Polk County August 4. In NEBRASKA first face fly adults were observed June 15 in Lincoln County. Populations continued to increase and peaked about August 11 at 16-17 per animal. Annoyance to range animals was noted through mid-September. Fly populations were held at about 7-8 flies per head where dust bags were used. Face fly populations remained light in NORTH DAKOTA until the first of August when counts on calves in Richland County reached 29 per face and up to 12 per face on cows. Some annoyance was noted in Dunn County with up to 6 flies per face.

HOUSE FLY (Musca domestica) emergence was heavy at several feedlots across NEBRASKA and developed into a serious problem in July and August. Severe problems were noted in Brown, Saunders, Lincoln, and Keith Counties, where counts ranged up to 10-12 flies per

Scudder grid. In WISCONSIN, counts began building up around dairy barns early in June and increased at a normal rate until late in August when very heavy counts were apparent throughout the southern three-fourths of the State. Much control was necessary around livestock farms and private residences. House fly continued to be the number one nuisance and pest to all beef, pork, and poultry operations in SOUTH CAROLINA. An increase in complaints from nonfarm families living near farms or processing areas was noted. Even with extensive fly control and educational efforts, the incidence of complaints remained high.

HORN FLY (Haematobia irritans) infestations were slightly below normal in MARYLAND. During June and July counts ranged 10-30 per head on unsprayed beef cattle. During the same period counts on sprayed dairy cattle ranged 0-15 per head. Populations dropped below economic levels in September. The heaviest horn fly infestations in OHIO were observed in the east-central and southern areas of the State but were never found to exceed 500 per side on livestock. In INDIANA, horn fly populations ranged 1-2 per steer in May and continued to increase until the last week in August, counts ranged 600-700 per steer. Populations began building up in ILLINOIS in late May and by mid-June had reached an average of 20 per animal statewide. By early August counts reached 100 per animal and remained at this level until late September. Horn fly was generally annoying on beef cattle throughout IOWA. Populations peaked in Story County on July 21 when about 400 per head were observed.

Horn fly annoyance to dairy cattle in WISCONSIN was observed in Columbia County as early as May 24 and moderate numbers were reported in Chippewa County in mid-June. The peak of activity occurred about August 1 when 20-40 flies per animal were observed on dairy cattle. Horn fly populations appeared to be down this year in most areas of NORTH DAKOTA. By June 9, counts in McKenzie County averaged 170 per animal. Counts averaged 35 per animal in Pierce County on June 23 and by July 14, populations had reached 240 per animal in Richland and Ransom Counties. On August 4, buffalo in Benson County averaged 150 flies per animal. In west-central NEBRASKA, horn fly averaged 5 per head on cattle in Keith, Arthur, McPherson, Logan, and Lincoln Counties on May 11. By mid-June, flies increased to 300-400 per head and by mid-July ranged 500-3,000 per animal. Populations remained at about 1,500 per head on range animals through August 23, then declined. Horn fly was active on cattle in OKLAHOMA from mid-March into late November. In Payne County the heaviest numbers, 1,500-1,700 per head, occurred in early June. Horn fly increased in the Trans-Pecos area of TEXAS in late April where counts ranged 400-3,000 per head in Presidio County. Medium to heavy infestations were noted in many counties in the Blacklands, north-central, Trans-Pecos, and Rolling Plain areas throughout the summer. Increasing populations were noted in the Panhandle area in late June. Adults averaged 100 per cow by March 24 in Jones County, MISSISSIPPI, and by mid-May averaged 179+ per cow in Marion, Monroe, and Oktibbeha Counties. Populations peaked in mid-July at 500+ per cow in Clay, Monroe, Montgomery, Noxubee, and Oktibbeha Counties and again in mid-September at 1,000+ per cow. Horn fly infestations were annoying and damaging to livestock throughout the fly season in southern ALABAMA beginning in late March. Infestations were limited mainly to beef cattle herds where proper control was not applied.

STABLE FLY (*Stomoxys calcitrans*) infestations were slow building up in NORTH DAKOTA but populations became economic with the hot, wet weather during August. The lack of a killing frost until October contributed to the prolonged annoyance. This species is primarily a feedlot and farm herd problem in North Dakota and is not a problem in the drier western areas of the State. The heaviest populations observed in NEBRASKA were seen in mid-August when flies ranged 20-25 per leg on feedlot animals in Lincoln and Keith Counties. Fly activity and breeding began to decrease by September 7. Stable fly became apparent on cattle in WISCONSIN late in May and increased rapidly in the northwest area early in June and in the southeast area later the same month. Moderate to severe annoyance to cattle occurred on warmer days and unusually numerous reports of stable flies biting humans were received. High numbers persisted until the end of September.

An established infestation of a LOUSE FLY (*Hippobosca longipennis*) was found on imported cheetahs in the San Diego Wildlife Park at Poway, San Diego County, CALIFORNIA. About 180 adult flies were recovered from a mature cheetah and 6 from a cub during a flea bath. Eradication treatments were initiated. This fly is a serious pest of carnivores in Africa.

MOSQUITO populations were heavier in MARYLAND during 1972 than in 1971. A total of 97,864 females were taken in 23 light traps operated in 16 counties. *Culex* spp. comprised 50 percent of the total collected and *Aedes sollicitans* 23 percent. This was a 64-percent increase over the total collected in 1971. Populations of flood water species increased rapidly after the passage of tropical storm Agnes. Cost of operating mosquito control and abatement programs in Maryland exceeded $1,140,000. In most areas, annoyance levels were similar to those of 1971. In OHIO, one or more cases of encephalomyelitis were reported in 66 counties. This disease is seasonal in the State, corresponding with that of mosquito activity. Thus far, 51 encephalomyelitis isolations have been confirmed from 6 species of *Aedes* spp. *Aedes vexans* was the most common mosquito in INDIANA, not only during the usual period of May and June, but all season. *A. sticticus* appeared with *A. vexans* early in the season. *A. trivittatus* was first observed at Lafayette, Tippecanoe County, June 2. *Psorophora* spp., particularly *P. ciliata*, were more common than usual. Heavy populations of *Aedes cinereus*, *A. stimulans*, and *A. communis* were apparent in WISCONSIN in mid-May near permanent wetlands. Moderate to severe annoyance to livestock and humans was reported. Populations moderated slightly through May and June due to dry weather. Rainy weather began early in July and populations increased drastically late in July, along with annoyance to humans and livestock. A few areas had problems with heartworm of dogs transmitted by mosquitoes. Mosquitoes became a problem to man and animals in almost all areas of NEW MEXICO after July because of rains and flooding.

BROWN DOG TICK (*Rhipicephalus sanguineus*) infestations ranged moderate to heavy in MARYLAND. This species was particularly common in the suburban areas of Prince Georges and Montgomery Counties during fall and winter months.

STORED PRODUCTS

INDIAN MEAL MOTH (*Plodia interpunctella*) infestations were reported damaging stored products in 26 IOWA counties during 1972. Infestations were reported in stored grain in a research laboratory, bulk and bagged seed corn in commercial warehouses, and stored corn or other stored products in homes in these counties. This represents a 35-percent increase in inquiries concerning this pest over those received in 1971.

CONFUSED FLOUR BEETLE (*Tribolium confusum*) adults were a problem in stored products in isolated areas of KENTUCKY. Counts averaged 1,600 per bushel of stored oats at a location in Nelson County and 73 per bushel of wheat at a location in Washington County. On a statewide basis, however, infestations were much less severe than usual. In NORTH DAKOTA, this pest infested 17,000 bushels of stored wheat in Cass County at the rate of 1,280 adults per bushel.

RICE WEEVIL (*Sitophilus oryzae*) was a serious pest of stored corn and grain sorghum in central and southern ALABAMA.

BENEFICIAL INSECTS

Highlights: CONVERGENT LADY BEETLE and a BRACONID WASP were effective in controlling pests of alfalfa, small grains, and corn in KANSAS and OKLAHOMA. Several PARASITIC WASPS of cereal leaf beetle, alfalfa weevil, walnut aphid, and European corn borer became established in new areas during 1972.

CONVERGENT LADY BEETLE (*Hippodamia convergens*) was instrumental in maintaining or reducing *Acyrthosiphon pisum* (pea aphid) infestations in alfalfa hay to below economic levels in NEVADA. In conjunction with parasites and other predators, this lady beetle was effective also in holding *Rhopalosiphum maidis* (corn leaf aphid), *Macrosiphum avenae* (English grain aphid), and *Schizaphis graminum* (greenbug) infestations below economic levels in the State. Convergent lady beetle was a major factor in the control of pea aphid during April and May throughout KANSAS. This lady beetle also was a principle factor in the control of *Therioaphis maculata* (spotted alfalfa aphid) in the State from mid to late July, especially in Reno and Sedgwick Counties. Convergent lady beetle was active in OKLAHOMA from early March into October. Heavy populations aided in the control of greenbug on wheat in many areas in late March and in sorghum during June and July. All stages of this predator were very common in alfalfa during March and April and in cotton from mid-June to mid-July in Oklahoma.

A BRACONID WASP (*Lysiphlebus testaceipes*) began exerting significant control pressure on *Schizaphis graminum* (greenbug) in southeast KANSAS during the third week of June. By August 11, this braconid wasp had eliminated greenbug infestations on sorghum throughout the State. In OKLAHOMA, *L. testaceipes* was active in greenbug-infested wheat by early March. Parasitism of greenbug by this braconid wasp was as high as 60 percent by the end of March.

An ICHNEUMON WASP (*Lemophagus curtus*) became established at Gull Lake in Kalamazoo County, MICHIGAN. Two previously established parasites of *Oulema melanopus* (cereal leaf beetle) larvae, 23(11) 1973

Tetrastichus julis (a eulophid wasp) and *Diaparsis carnifer* (an ichneumon wasp), are increasing. Populations of *T. julis* were sufficiently abundant to parasitize a high percentage of cereal leaf beetle larvae. Additional releases of this parasite were made at 37 locations in Michigan, mostly in the southern half of the Lower Peninsula. Releases of *T. julis* are planned throughout the State during 1973 in locations where cereal leaf beetle has been found. Recoveries of *T. julis* were made in 17 Lower Peninsula counties and is now present in more than 25 new locations. This is a major step in the efforts to achieve biological control of cereal leaf beetle.

An ICHNEUMON WASP (*Bathyplectes curculionis*) and a EULOPHID WASP (*Tetrastichus incertus*), larval parasites of *Hypera postica* (alfalfa weevil), were found throughout PENNSYLVANIA, with *B. curculionis* remaining the dominant larval parasite in the State. The heaviest activity of *T. incertus* occurred after *B. curculionis* activity declined in July. A BRACONID WASP (*Microctonus colesi*), a parasite of *H. postica* adults, also was prevalent throughout Pennsylvania. *M. aethiops* was released in the extreme southwestern counties of Pennsylvania in 1970 and 1971 but no recoveries were made during 1972.

Adults of *Bathyplectes curculionis* and *B. anura* ranged 4-5 per 100 sweeps of alfalfa in KENTUCKY early in the season and parasitism ranged 0-47 percent during the peak of larval activity in the State. *B. anura* and *B. stenostigma* were collected in OHIO for the first time since originally released. (See CEIR 22(23): 337 and 22(32):528 respectively). A total of 2,550 alfalfa weevil parasites, including *B. anura*, *M. colesi*, and a CHALCID WASP (*Peridesmia discus*), were released at various locations throughout OREGON.

A BRACONID WASP (*Trioxys pallidus*) was reared from *Chromaphis juglandicola* (walnut aphid) collected in walnut orchards in the Talent area of OREGON in fall 1972. This recovery indicates the establishment of *T. pallidus* in Jackson County. The initial release of this braconid wasp at this locality in Oregon was made in August 1971.

A EULOPHID WASP (*Sympiesis viridula*) was taken from larval burrows of *Ostrinia nubilalis* (European corn borer) in stalks of corn grown for grain in Warren County, INDIANA, October 25, 1971, and in Rush County (CEIR 22(35):583) by R.W. Meyer. Both determinations were by B.D. Burks. Warren County is a new county record. These were the first records of this eulophid wasp in Indiana since 1948.

An ICHNEUMON WASP (*Eriborus terebrans*) adult, reared from a burrow of *O. nubilalis* in a 1971 cornstalk in La Porte County, INDIANA, by R.W. Meyer, emerged June 8, 1972. An adult reared from green corn at an agronomy farm in Tippecanoe County emerged July 27. Eleven adults of this ichneumon wasp were reared from 200 European corn borer burrows collected during April from overwintered cornstalks in Harrison Township, Fayette County, and a cocoon was taken from green corn in Indian Creek Township, Lawrence County. La Porte, Tippecanoe, Fayette, and Lawrence Counties are all new county records for *E. terebrans*.

Weather of the week continued from page 144.

Snow fell in the mountains in Arizona and in New Mexico. Strong winds caused blowing snow and drifting snow hampering travel in those areas. Nine inches of new snow fell in central Arizona and 6 inches fell at Los Alamos, New Mexico, Thursday night and early Friday morning. Sixteen inches of snow lay on the ground in Flagstaff, Arizona, Friday morning. A low centered over Nevada early Sunday produced heavy snow over the mountains of California, Nevada, and Utah. Wet weather persisted over the eastern half of the Nation. Severe thunderstorms struck eastern Texas and the lower Mississippi River Valley Saturday. Tornadoes occurred near Waco, Texas, and Dogpatch, Arkansas, Saturday forenoon. A tornadoe struck Hubbard, Texas, a town of 1,500 population, killing 4 persons, injuring 80, and damaging one-third of the town. Other severe storms occurred in the afternoon and evening. Early Sunday morning, a tornadoe damaged homes, power lines, trees, and injured several persons at Mendenhall, Mississippi. Heavy rains fell over much of the Southeast. Jacksonville, Florida, measured 4.90 inches in 24 hours ending Saturday morning.

TEMPERATURE: Temperatures below freezing were common over the Great Basin, Rocky Mountains, and much of the northern and central Great Plains several mornings early in the week. Afternoon temperatures remained below freezing in spots in northern Minnesota and northern Michigan one or two days. Escanaba, Michigan, warmed only to 30 degrees Monday. Other extremes: Fort Myers, Florida, and Cotulla, Texas, warmed to the upper 80's several days. Maximums over the Great Plains ranged from the 30's and 40's in the Dakotas to the 70's and 80's in Texas and Louisiana. Afternoon temperatures in the West ranged generally from the 30's to the 50's in the north and to the 60's along the Mexican border. Subzero temperatures occurred in the higher Rocky Mountains on one or two mornings. Southerly winds brought unusual warmth to the eastern half of the Nation late in the week and over the weekend. Youngstown, Ohio, registered 69 degrees Saturday and Sunday afternoons. It had never before been so warm so early in the season at Youngstown. London and Pikesville, both in Kentucky, recorded 82 degrees Friday afternoon. Traverse City, Michigan, warmed to 71 degrees Sunday afternoon. The entire Nation, except the Far Southwest, averaged warmer than normal last week. A large area from the Great Lakes to Tennessee averaged 15 to 25 degrees warmer than normal.

NATIONAL WEATHER SERVICE'S 30-DAY OUTLOOK
MID-MARCH TO MID-APRIL 1973

The National Weather Service's 30-day outlook for mid-March to mid-April is for temperatures to average above seasonal normals from the Continental Divide to the Appalachian Mountains. Subnormal temperatures are indicated for the western quarter of the Nation. In unspecified areas near normal temperatures are in prospect. Precipitation is expected to exceed normal over the West Coast States, the Great Basin, and the Midwest. Subnormal totals are indicated for the Gulf and south Atlantic Coast States as well as the central and southern Plains. Elsewhere near normal precipitation is expected.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the National Weather Service. You can subscribe through the Superintendent of Documents, Washington, D.C. 20250. Price $5.00 a year.

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